

N And P-Channel Enhancement Mode MOSFET

Description

The PECN6667D6 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge . The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

◆ N-channel:

$V_{DS} = 30V$, $ID = 18A$

$R_{DS(ON)} = 14.9m\Omega$ (typical) @ $VGS = 10V$

$R_{DS(ON)} = 19.1m\Omega$ (typical) @ $VGS = 4.5V$

P-Channel:

$V_{DS} = -30V$, $ID = -18A$

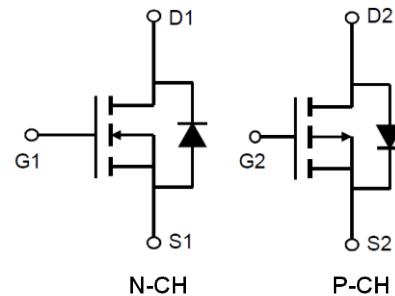
$R_{DS(ON)} = 17.3m\Omega$ (typical) @ $VGS = -10V$

$R_{DS(ON)} = 22.9m\Omega$ (typical) @ $VGS = -4.5V$

- ◆ Excellent gate charge $\times R_{DS(ON)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

**Application**

- ◆ Pch+Nch Complementary MOSFET for DC-FAN
- ◆ H-Bridge application

Schematic diagram**Marking and pin assignment**

PDFN5x6-8L-B



Top View



Bottom View

XXXX—Wafer Information

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN6667D6	-55°C to +150°C	PDFN5*6-8L-B	5000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit		Unit
		N	P	
Drain-source voltage	V_{DS}	30	-30	V
Gate-source voltage	V_{GS}	± 20	± 20	V
Operating junction Temperature range	T_j	-55—150	-55—150	°C
Drain Current-Continuous (Silicon Limited)	I_D	18	-18	A
		12	-12	

Pulsed Drain Current (Package Limited)		I _{DM}	72	-72	A
Avalanche Current ^C		I _{AS} , I _{AR}	24	-32	A
Avalanche energy L=0.1mH ^C		E _{AS} , E _{AR}	18	36	mJ
Power Dissipation ^B	T _A =25°C	P _D	10	20	W
	T _A =75°C		4	8	
Junction and Storage Temperature Range		T _J , T _{STG}	-55—150		°C

N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-body leakage	I_{GSS}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=\pm20\text{V}$	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	1.0	1.45	2.0	V
Drain-source on-state resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=10\text{A}$	-	14.9	20	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=10\text{A}$	-	19.1	26	
Forward transconductance	g_{fs}	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=10\text{A}$	-	15	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}$ $f=1.0\text{MHz}$	-	534	-	pF
Output capacitance	C_{OSS}		-	74	-	
Reverse transfer capacitance	C_{RSS}		-	61	-	
Gate resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}$, $f=1.0\text{MHz}$	-	1.1	-	Ω
Switching Characteristics						
Turn-on delay time	$t_{\text{D(ON)}}$	$V_{\text{DS}}=15\text{V}$ $V_{\text{GS}}=10\text{V}$ $R_L=1.8\Omega$ $R_{\text{GEN}}=3\Omega$	-	5	-	ns
Rise time	t_r		-	3.5	-	
Turn-off delay time	$t_{\text{D(OFF)}}$		-	9	-	
Fall time	t_f		-	3.5	-	
Total gate charge	Q_g	$V_{\text{DS}}=15\text{V}, I_{\text{D}}=10\text{A}$ $V_{\text{GS}}=10\text{V}$	-	12.9	-	nC
Gate-source charge	Q_{gs}		-	1.85	-	
Gate-drain charge	Q_{gd}		-	2.7	-	

Typical Performance Characteristics

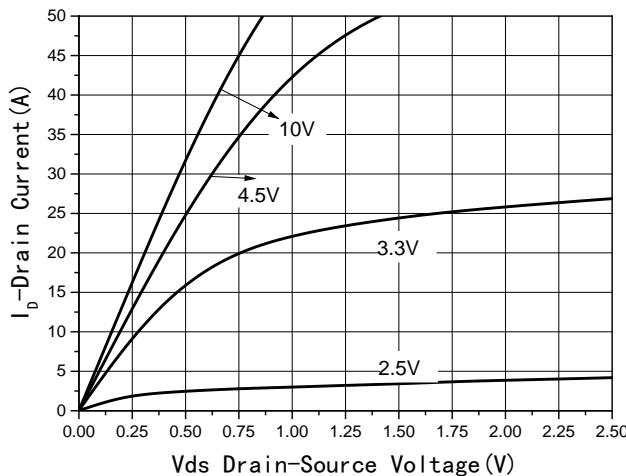


Fig1 Output Characteristics

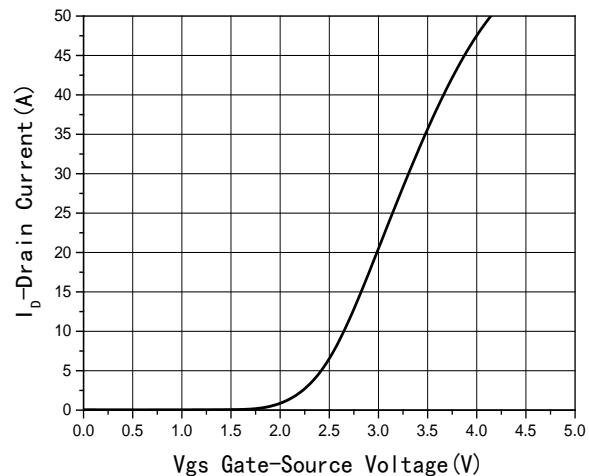


Fig2 Transfer Characteristics

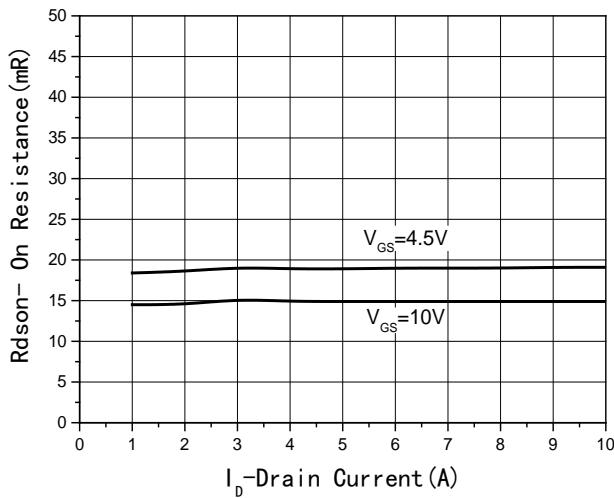


Fig3 Rdson-Drain current

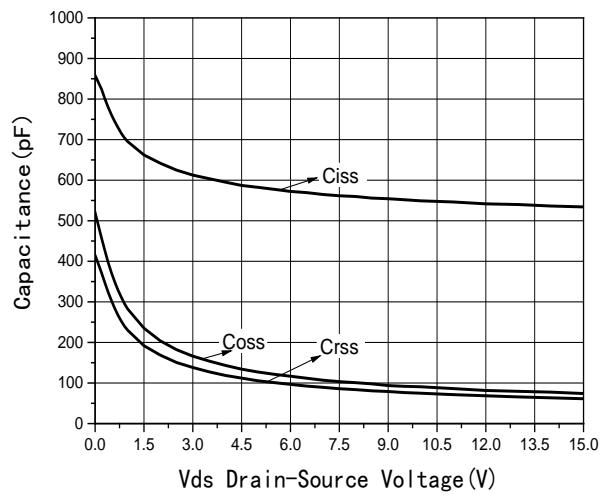


Fig4 Capacitance vs Vds

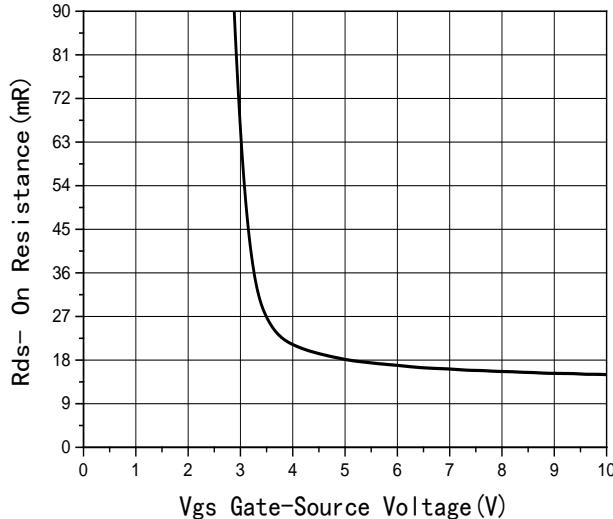


Fig5 Rdson-Gate Drain voltage

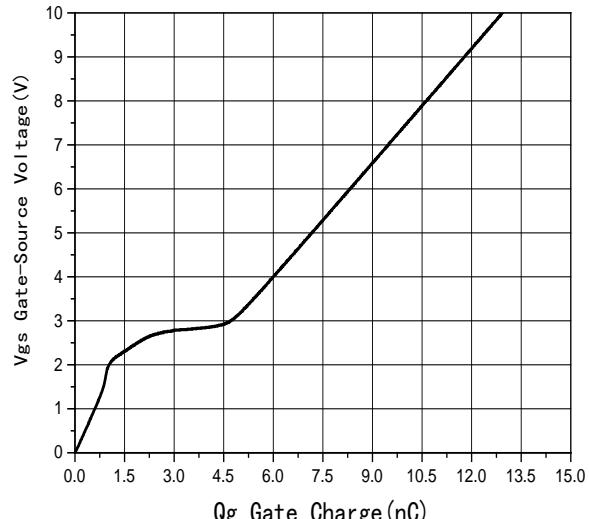


Fig6 Gate Charge

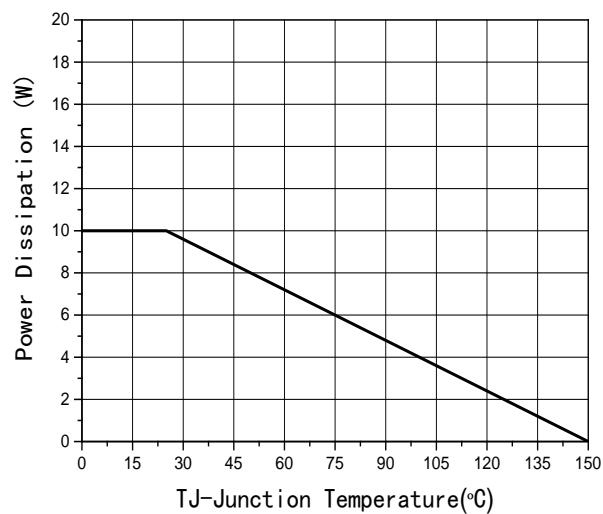


Fig7 Power De-rating

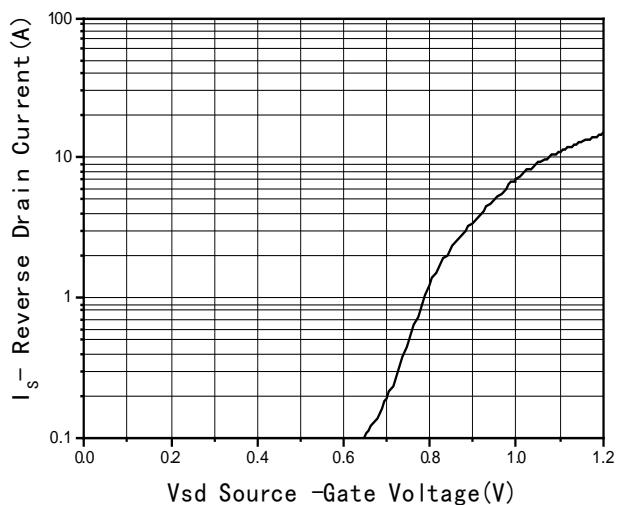


Fig8 Source-Drain Diode Forward

P-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}$	-	-	-1	μA
Gate-body leakage	I_{GSS}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=\pm20\text{V}$	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=-250\mu\text{A}$	-1	-1.6	-2.5	V
Drain-source on-state resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-10\text{A}$	-	17.3	22	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-10\text{A}$	-	22.9	30	
Forward transconductance	g_{fs}	$V_{\text{DS}}=-5\text{V}, I_{\text{D}}=-10\text{A}$	-	18	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	$V_{\text{DS}}=-15\text{V}, V_{\text{GS}}=0\text{V}$ $f=1.0\text{MHz}$	-	1587	-	pF
Output capacitance	C_{OSS}		-	165	-	
Reverse transfer capacitance	C_{RSS}		-	146	-	
Gate resistance	R_{g}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}$, $f=1.0\text{MHz}$	-	4	-	Ω
Switching Characteristics						
Turn-on delay time	$t_{\text{D(ON)}}$	$V_{\text{DS}}=-15\text{V}$ $V_{\text{GS}}=-10\text{V}$ $R_{\text{L}}=2.3\Omega$ $R_{\text{GEN}}=3\Omega$	-	10	-	ns
Rise time	t_{r}		-	5.5	-	
Turn-off delay time	$t_{\text{D(OFF)}}$		-	3.6	-	
Fall time	t_{f}		-	4.6	-	
Total gate charge	Q_{g}	$V_{\text{DS}}=-15\text{V}, I_{\text{D}}=-10\text{A}$ $V_{\text{GS}}=-10\text{V}$	-	31.7	-	nC
Gate-source charge	Q_{gs}		-	4.5	-	
Gate-drain charge	Q_{gd}		-	6.4	-	

Typical Performance Characteristics

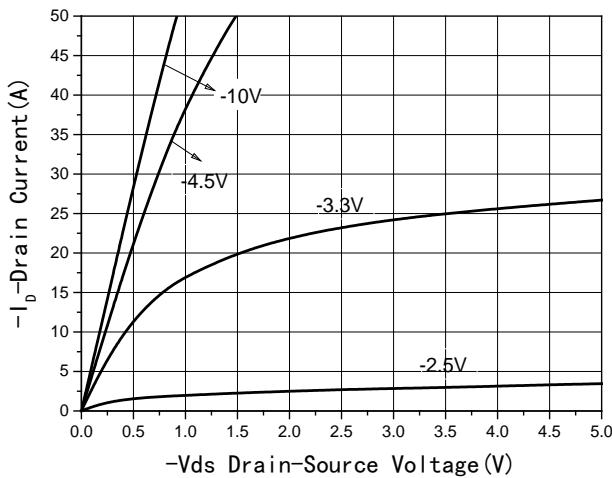


Fig1 Output Characteristics

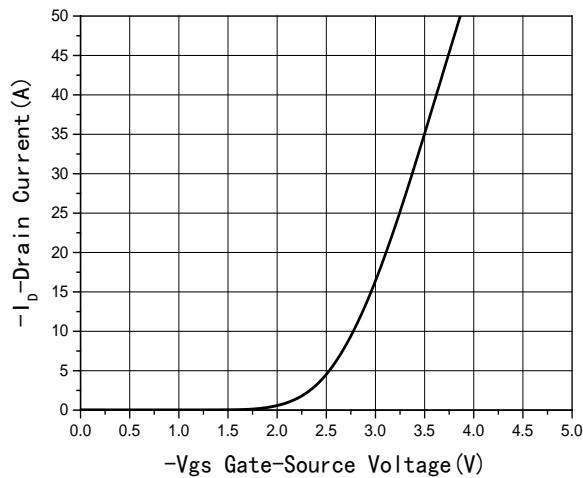


Fig2 Transfer Characteristics

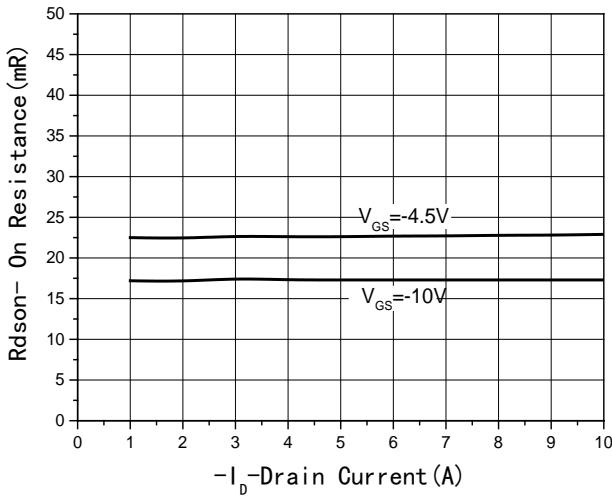


Fig3 Rdson-Drain current

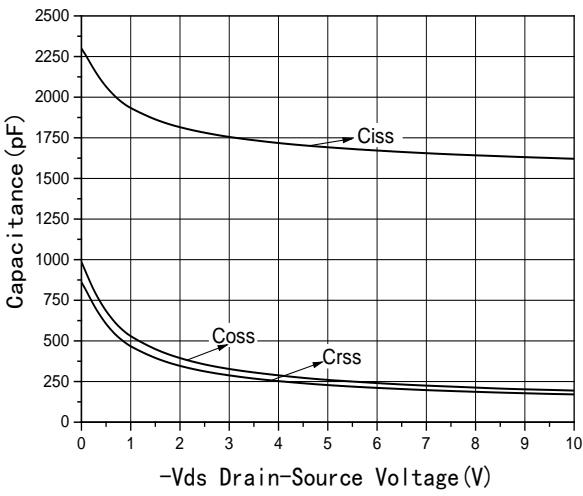


Fig4 Capacitance vs V_{ds}

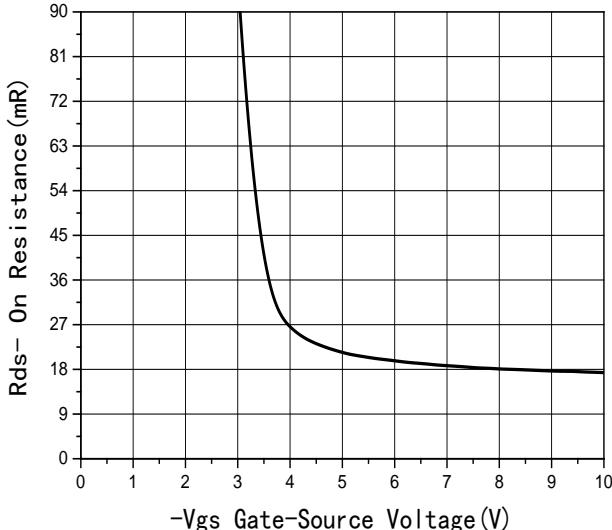


Fig5 Rdson-Gate Drain voltage

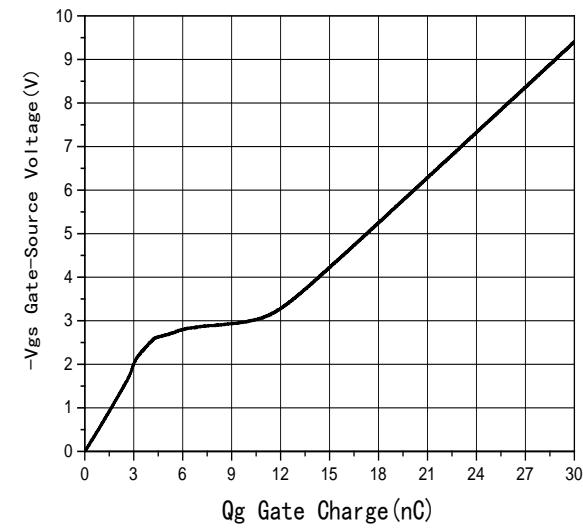


Fig6 Gate Charge

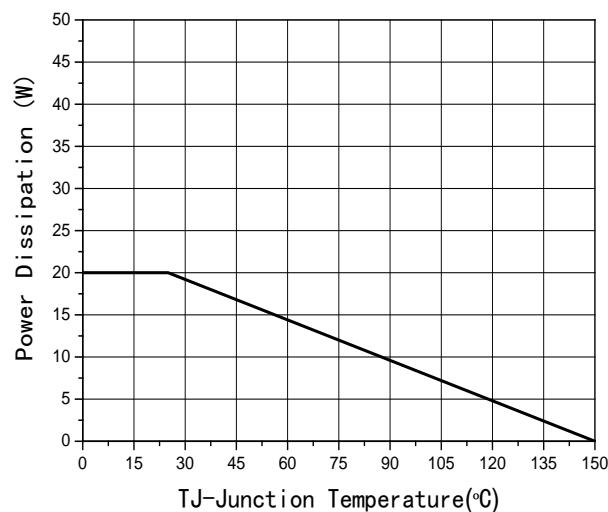


Fig7 Power De-rating

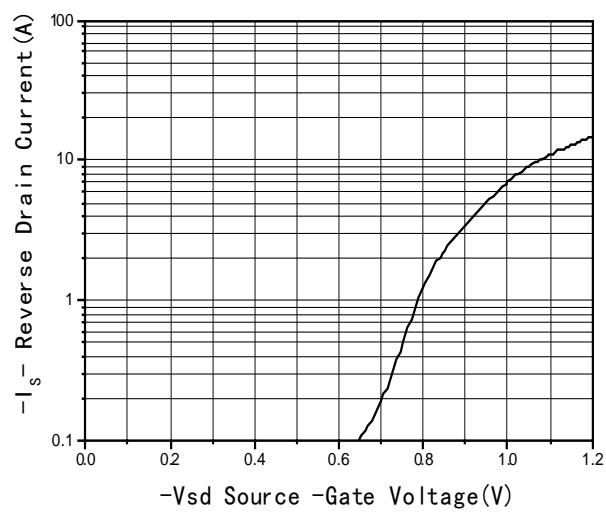
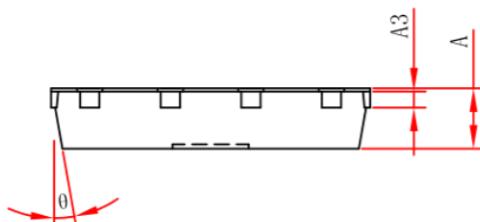
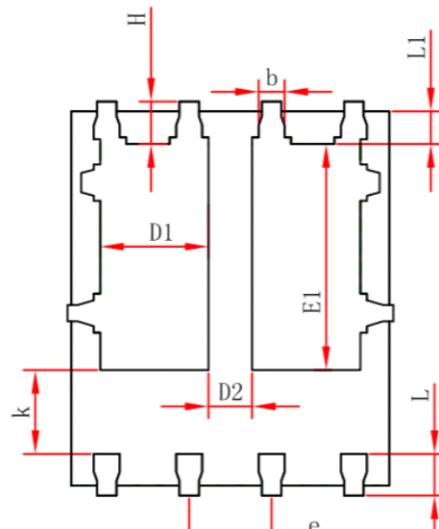
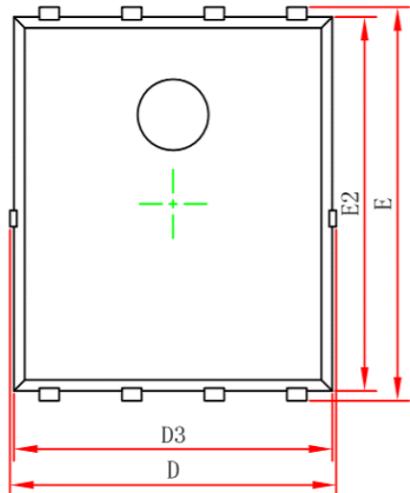


Fig8 Source-Drain Diode Forward

Package Information

- PDFN5*6-8L-B



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.154REF.		0.006REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°